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PA - (NSMO) NISSAN MOTOR CO LTD
PN - JP6121926 A 19940506 DW199423 B01J20/10 003pp
PR - JP19920272982 19921012
XA - C1994-084218
XIC - B01J-020/10 ; B01J-021/16
AB - J06121926 Waste gas purification catalyst consists of a honeycomb
support with a coating layer which contains Cu-contg. Fe-silicate.
- USE/ADVANTAGE - Used to remove NOx, HC, and CO from a lean burn
combustion exhaust.
- In an example, 2kg of Fe-silicate powders prepd. by hydrothermal
synthesis were mixed with 10.4 kg of an aq. soln. dissolving 0.2
mol/litre copper acetate over 2 hrs.; then the powders were filtered
off. This mixing and filtering process was repeated three times and
the resultant powders dried at 80 deg.C overnight and fired at 500
deg.C for 2 hrs. A slurry contg. 1800 g of the Cu/Fe-silicate, 1170 g
of silica sol, and 1170 g of water was coated on a monolithic support
and fired at 400 deg.C.(Dwg.0/1)
CN - 9423-B9501-C 9423-B9501-R R01784-X R90120-X R01423-X
DRL - 1784-U 1423-U
IW - WASTE GAS PURIFICATION CATALYST LEAN BURN COMBUST EXHAUST COMPRISE
HONEYCOMB SUPPORT COATING COPPER CONTAIN IRON SILICATE
IKW - WASTE GAS PURIFICATION CATALYST LEAN BURN COMBUST EXHAUST COMPRISE
HONEYCOMB SUPPORT COATING COPPER CONTAIN IRON SILICATE
NC - 001
OPD - 1992-10-12
ORD - 1994-05-06
PAW - (NSMO) NISSAN MOTOR CO LTD
TI - Waste gas purificn. catalyst for lean burn combustion exhaust -
comprises honeycomb support coated with copper-contg. iron silicate

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PATENT ABSTRACTS OF JAPAN

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(21)Application number : 04-272982 (71)Applicant : NISSAN MOTOR CO LTD

(22)Date of filing : 12.10.1992 (72)Inventor : KACHI NAOKI
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(54) CATALYST FOR PURIFYING EXHAUST GAS

(57)Abstract:

PURPOSE: To obtain a catalyst for purifying an exhaust gas exhibiting excellent purifying performance even in lean region of internal combustion engine by providing a coating layer made of an inorganic material essentially containing a copper containing Fe-silicate as a metallosilicate on a honeycomb carrier.

CONSTITUTION: The catalyst for purifying the exhaust gas of internal combustion engine is constituted by providing the coat layer made of the inorganic material mainly containing the Cu containing Fe-silicate as the metallosilicate on the honeycomb carrier. The catalyst for purifying the exhaust gas constituted in this way exhibits excellent exhaust gas purifying performance even in the lean region of the internal combustion engine exhaust gas containing a large quantity of oxygen. Specifically by carrying Cu as an active metal on the

CLAIMS

[Claim(s)]

[Claim 1] The catalyst for exhaust gas purification under the lean atmosphere characterized by having the coat layer which consists of an inorganic substance which contains Fe-silicate which contains Cu as metallosilicate as a principal component on honeycomb support.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to an internal combustion engine's catalyst for exhaust gas purification.

[0002]

[Description of the Prior Art] As a conventional catalyst for exhaust gas purification, although many catalysts are proposed, what coated honeycomb support with what supported the noble-metals system active ingredient to the activated alumina which generally uses gamma-alumina as a principal component is used as a fundamental catalyst.

[0003]

[Problem(s) to be Solved by the Invention] With the catalyst for exhaust gas purification using such a usual activated alumina, when it has only the activity as the so-called three way component catalyst with which an air-fuel ratio (A/F) has catalytic activity only the condition near SUTOIKI and an air content operates an engine in many fuel-efficient Lean fields, exhaust gas purification activity falls.

[0004]

[Means for Solving the Problem] The catalyst of this invention is what solved the trouble of such a conventional catalyst, and it is characterized by having the coat layer which consists of an inorganic substance which contains Fe-silicate which contains Cu as metallosilicate as a principal component on honeycomb support.

[0005]

[Function] An operation is explained below. In the catalyst of this invention, it has the purification engine performance of exhaust gas in which it excelled in the Lean field of the engine exhaust gas with which oxygen is contained so much.

lean atmosphere -- nitrogen oxides (NOX) although Fe-silicate etc. is known as matter which has purification activity -- Fe-silicate -- NOX the top where purification activity is low -- a hydrocarbon (HC) and carbon monoxide (CO) etc. -- the purification activity of other exhaust gas injurious ingredients is also remarkably small. By supporting to Fe-silicate by using Cu as an active metal kind, they are HC, CO, and NOX. It is possible to raise all purification engine performance, and exhaust gas purification excellent in the Lean field can be attained. It is also possible to use an ion-exchange method as an approach of supporting Cu, and to be based on the approach of to sink in and others.

[0006]

[Example] An example, the example of a comparison, and the example of a trial explain this invention.

Fe compounded with example 1 hydrothermal crystallization method - Cu concentration is 0.2 at a room temperature in 2kg of silicate powder. A mol/L It stirred in 10.4kg of copper acetate water solutions, and filtration 2 hours after was performed. After repeating actuation of the above-mentioned ion-exchange-filtration 3 times, it dried at 80 degrees C in oven one whole day and night. Furthermore, baking was performed in 500 ** for 2 hours, and Cu ion-exchange Fe-silicate powder was prepared. 1800g [of Cu/Fe-silicate powder], and silica sol (20% of solid content) 1170g 1170g of and water The slurry which supplied to the magnetic ball mill pot, ground, and was obtained was applied so that it might become the amount of coats of 260g/piece to monolith support (1.3L, 400 cels). It calcinates in 2-hour air at the desiccation back and 400 degree C, and is a catalyst. No.1 was prepared.

[0007] It is Cu concentration of an example 2 ion-exchange solution 0.1 It is a catalyst like an example 1 except having been referred to as a mol/L. No.2 were adjusted.

[0008] It is a catalyst like an example 1 except having used the copper nitrate as a Cu raw material at the time of the example 3 ion exchange. No.3 were prepared.

[0009] The coating actuation except having dried and calcinated what supplied and stirred Fe-silicate 2kg in adjustment of example 4 Cu/Fe-silicate in the water solution in which 400g copper acetate was dissolved to 10kg of water, and carried out evaporation to dryness in oven as it was is a catalyst like an example 1. No.4 were prepared.

[0010] It coated so that it might become the amount of coats of 260g/piece like an example 1, only example of comparison 1Fe-silicate was calcinated after drying, the catalyst of the example 1 of a comparison was prepared, and it considered as Catalyst A.

[0011] Only example of comparison 2Cu-silicate was coated like the example 1 of a comparison, after drying, it calcinated, and the catalyst B of the example 2 of a comparison was prepared.

[0012] A dinitrodiammine palladium solution is used to 1000g of activated-alumina powder which uses example of comparison 3 gamma-alumina as a main component, and it is palladium 1.5. In addition, it dried so that it might become weight %, and it calcinated in the air air current for 400 ** 2 hours. Activated-alumina 320 g and the acetic-acid acidity boehmite sol (sol obtained by adding HNO₃ 10% of the weight to the 10 % of the weight suspension of boehmite aluminas) which use 1400g of this palladium support activated alumina, 936g of cerium oxide, and gamma-alumina as a main component 2212g It supplied to the ball mill pot, it ground for 8 hours, and the slurry was obtained. It is a monolith support base material (1.3 L and 400 cel) about the obtained slurry. It applied, and after drying, it calcinated in the air ambient atmosphere by 400 ** for 2 hours. It was set as coverage, and 160 g/the individual at this time.

[0013] Next, after being easy to add and stirring an acetic-acid rhodium solution to 1000g of activated-alumina powder which uses gamma-alumina as a main component so that it may be set to 1 % of the weight of Rh(s), like the above, desiccation and baking were performed and rhodium support alumina powder was made. Rhodium support alumina powder 500g, nitric-acid acidity boehmite sol 637g, activated-alumina powder which uses gamma-alumina as a principal component 265g was supplied to the ball mill pot, after having applied the slurry which ground for 8 hours and was obtained so that it might become the amount of coats of 40g/piece, and drying, it calcinated in 2-hour air by 400 **, and Catalyst C was prepared.

[0014] The converter for an experiment was filled up about the catalyst of example of trial each example, and the example of a comparison, and 18.0 A/F= about gas performed the performance evaluation test on the following conditions using exhaust air model gas. The result is shown in Table 1.

Performance-evaluation condition catalyst capacity 0.12L evaluation equipment Exhaust air model gas evaluation equipment (gas uses a chemical cylinder)

Catalyst inlet temperature 400 ** space velocity About 20,000h⁻¹ inlet-port gas presentation Model gas presentation HC=1600ppm equivalent to the average air-fuel ratio (A/F) 18.0 (CI conversion)

NO=1000ppm CO=1200ppm 2 = 14.0% O₂ of COs = 4.5% H₂ O=10 %N₂

Remainder [0015]

[Table 1]

触 媒	400℃での転化率 (%)			備 考
	HC	CO	NO	
No. 1	60	75	40	実施例 1
No. 2	57	70	37	実施例 2
No. 3	59	72	39	実施例 3
No. 4	58	70	37	実施例 4
A	23	15	28	比較例 1
B	5	10	3	比較例 2
C	99	98	12	比較例 3

[0016]

[Effect of the Invention] As explained above, the catalyst for exhaust gas purification of this invention has the purification engine performance which was excellent also in the Lean field as shown also in Table 1 by having the coat layer which consists of an inorganic substance which contains Fe-silicate which contains Cu as metallosilicate as a principal component on honeycomb support.

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